National Institute of Environmental Health Sciences

Acute effects of diurnal temperature range on mortality in 8 Chinese cities

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Abstract:

Diurnal temperature range (DTR) is a meteorological indicator closely associated with global climate change. There have been no multicity studies in China addressing the DTR-related health impact. We hypothesized that an increase of DTR is associated with higher daily mortality with a potential lag of effect, and investigated the acute effects of DTR on total, cardiovascular, and respiratory mortality in 8 large Chinese cities from 2001 to 2010. We first calculated city-specific effect of DTR in the full year, the cool season (November to the next April) and the warm season (May to October) separately using a semi-parametric generalized additive model; then we pooled the city-specific estimates with meta analysis. After adjusting for long-term and seasonal trends, temperature, relative humidity and air pollution levels, we found statistically significant associations between DTR and daily mortality, especially in cool seasons. A 1. °C increment of DTR on lag-day 1 corresponded to a 0.42% (95% CI, 0.14 to 0.70) increase in total non-accidental mortality, 0.45% (95% CI, 0.26 to 0.65) increase in cardiovascular mortality, and a 0.76% (95% CI, 0.24 to 1.29) increase in respiratory mortality in cool seasons. Deaths among females and elderly (≥. 65. years) were more strongly associated with DTR than among males and younger people (

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

Air Pollution: Interaction with Temperature, Other Air Pollution

Air Pollution (other): SO2;NO2

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Injury, Respiratory Effect

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly

Other Vulnerable Population: Females

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content